

II. *Descriptions of three British Species of fresh-water Fishes belonging to the Genus Leuciscus of Klein.* By WILLIAM YARRELL, Esq. F.L.S. & Z.S.

Read June 19th, 1832.

PENNANT in his published account of a Tour in Scotland and Voyage to the Hebrides, pp. 11. and 12, has the following observation.—“In the Mersey near Warrington, and in the river Alt, which runs by Sephton, Lancashire, into the Mersey near Formby, a fish called the Graining is taken, which in some respects resembles the Dace, yet it is a distinct and perhaps new species.”

A short description of this fish, occupying a few lines only, appears in the quarto edition as well as in both octavo editions of the British Zoology; and the Graining is also characterized by Shaw in the 5th volume of his General Zoology, page 234, as follows:

“*Cyprinus Lancastriensis.* Pennant’s Graining.

“C. argenteus, dorso subrecto cœrulescente, oculis pinnisque inferioribus rubentibus.”

Notwithstanding these notices, this fish remains comparatively unknown to the present time, and has not, that I am aware, been found in any other locality.

One of the streams which produce the Graining rises in Knowsley Park; and I have, by the kindness of Lord Stanley, the President of this Society, been most liberally supplied with specimens of this fish, from the examination of which the following particulars have been derived.

The Graining, though similar to the Dace in shape, is yet distinguished from it by being still more slender in its form. In the Dace the length of the fish is in proportion to the depth as 4 to 1: in the Graining these proportions are as 5 to 1; and there are also other differences to be hereafter noticed.

The Graining has the top of the head, the back, and upper part of the sides of a pale drab-colour tinged with blueish red, and separated from the lighter-

coloured and inferior parts by a well-defined boundary line; the irides are yellowish white; infra-orbital portion of the head, the operculum, and sides, shining silvery white tinged with yellow; all the fins pale yellowish white; the lateral line descending from the upper angle of the operculum by a gentle curve to the middle of the body, thence to the centre of the tail in a straight line; the scales of moderate size, marked with numerous concentric striæ, and prominent radiating elevated ridges, the central portion of each scale being brighter than its sides, and producing the appearance of shining longitudinal lines extending the whole length of the body. The head is small, depressed; the cheeks flat; the line of the back but little elevated; the dorsal fin commences exactly half-way between the nose and the end of the fleshy portion of the tail; the first dorsal fin-ray is short, the second ray the longest, the last ray double. The mouth is small, without teeth on either of the maxillary bones; the eye large; nostrils pierced nearer the eye than the nose; branchiostegous rays 3, operculum of two pieces. The pectoral fin arises below a triangular plate directed backwards; the abdominal line moderately convex; the ventral fins are placed on a vertical line, but little in advance of the anterior portion of the dorsal fin; the anal fin commences, on a vertical line, immediately under the termination of the dorsal fin-rays, when that fin is depressed; the first ray of the anal fin is short, the second ray the longest, the last ray double; the fleshy portion of the tail is long and slender, its rays deeply forked. I can speak with confidence to the differential characters of the Graining and Dace, having been favoured on this occasion with a Dace from the same stream which produced the Graining. The length of the Dace compared to the depth is, as I have stated, but as 4 to 1; the back and sides are yellowish olive strongly tinged with blue, passing by imperceptible gradations to silvery white beneath; the lower fins are pale red; the pectoral fin not surmounted by a similar triangular plate; and the radiating lines on each scale are produced by grooved depressions and not by elevated ridges. The number of all the fin-rays is different, those in some of the fins being greater, and in others less.

	D.	P.	V.	A.	C.
Graining . . . . .	9.	17.	10.	11.	19.
Dace . . . . .	12.	15.	9.	12.	19.

Several streams in the townships of Burton Wood and Sankey, which flow into the Mersey below Warrington, and others in or near the township of Knowsley, which also form the Alt, produce the Graining in considerable numbers. In its habits and food it resembles the Trout, frequenting both the rapid and still parts of the rivers, but is not known to exist in ponds. It is fished for with artificial flies like the Dace or Trout; and Mr. Bainbridge, an enthusiastic fisherman, in his excellent Fly-fisher's Guide, published at Liverpool, says, "that as they rise freely, they afford good sport to the angler, and when in the humour, it is not difficult to fill a pannier with them. They sometimes, though not commonly, exceed half a pound in weight, and are much better eating than the Dace."

The largest specimen sent up to me on the present occasion measured nine inches in length.

A short description of the Graining in Mr. Bainbridge's work is thus given. "Rather more slender than the Dace; the body almost straight; colour of the scales silvery, with a blueish cast; the eyes, the ventral and the anal fins, are of a pale colour."

Following the systematic arrangement of Baron Cuvier in the 2nd volume of the *Règne Animal*, this species will now range under the first division of the genus *Leuciscus* of Klein, distinguished by the position of the dorsal fin, which is placed in a vertical line immediately over the ventral, and of which division our well-known Roach and Dace are examples.

As the specific character of the Graining given by Dr. Shaw does not precisely agree with that fish as described by Mr. Bainbridge and myself, I propose to substitute the following, but still retaining the trivial name applied to the species by that naturalist.

*Leuciscus Lancastriensis*. Pennant's Graining.

L. elongatus, pinnâ dorsali supra pinnas ventrales positâ, caudali profundè bilobâ, capitis lateribus suprâ subparallelis; ore parvo; dorso lateribusque supernè subrufescenti-isabellinis, infernè ventreque argenteis.

With specimens of the Graining, for which I acknowledge my great obligations to Lord Stanley, another species of the same genus was sent, which is also new to our British catalogue, and which, like the Graining, is not de-

scribed, as far as I have been able to ascertain, in any of the different works of European ichthyologists.

From the prevailing blue colour of this fish, I have been induced to call it the Azurine, *Leuciscus caeruleus*. It belongs to Cuvier's second division of the genus *Leuciscus* of Klein, a division intended to include those species in which the dorsal fin is placed, in a vertical line, over the space between the ventral and anal fins, and of which division our Red-eye, Bleak, and Minnow, are examples. The specific characters of the Azurine may be stated as follows:

L. ovato-lanceolatus, pinnâ dorsali pone pinnas ventrales positâ; dorso plumbeo, ventre argenteo, pinnis albis.

B. 3. D. 10. P. 16. V. 9. A. 12. C. 19.

The depth of this fish is to its length as 7 to 2, and it is therefore in shape very similar to our Red-eye; but is at once distinguished from that species by the silvery whiteness of the abdomen, which in the Red-eye is of a brilliant golden orange; and also by its white fins, which in the other are invariably of a fine vermillion. It also differs in the number of its fin-rays.

The Azurine has the upper part of the head, back and sides of slate blue, passing into silvery white beneath, and both shining with metallic lustre; the irides white, tinged with pale straw yellow; all the fins white; the lateral line, descending rapidly from the upper edge of the operculum, takes a curve parallel to the deep convex line of the abdomen; the scales large, marked with a variable number of radiating lines; the head small, depressed, and broad; the back arched; the dorsal fin commences half-way between the posterior edge of the eye and the end of the scaly portion of the tail; the first dorsal fin-ray is short, the second ray the longest, the last ray double. The muzzle is blunt; the mouth small, and without teeth; the eye large; nostrils pierced on the upper surface of the nose, midway between the eye and the upper lip; operculum of two portions, the upper one large and marked with radiating lines. The abdomen convex; the pectoral fins long, reaching nearly to the origin of the ventral fins, which arise, on a vertical line, considerably in advance of the dorsal fin, and thus bring that fin over the interval between the ventral and anal fins. From the vent the body diminishes rapidly, and the

anal fin is situated on the obliquity thus produced. The first ray of the anal fin is short, the second the longest, the last ray double. The fleshy part of the tail is narrow, the rays moderately forked, the central rays being only half as long as those which are terminal.

The localities from which this species is derived, within the township of Knowsley, are but limited. It is hardy, tenacious of life, and spawns in May. The flesh is said to be firm, of good flavour, and to resemble that of the Perch. The food, and the baits used for its capture, are the same as those taken by the Carp; and the largest specimen known was not supposed to exceed one pound in weight. I hope at some future period to be able to add further details.

While fishing in the month of August last in the Thames below Woolwich, with the mouth of a whitebait net open against a strong flood-tide, I caught a single specimen of *Cyprinus Dobula* of Linnæus, but have not been fortunate enough to obtain any more since. This species, well described and figured by Bloch, No. 5, is common to the Elbe, the Weser, and other rivers on the opposite coast, but has not, that I am aware, been recorded before as having been taken in any river of England. This fish also belongs to the genus *Leuciscus* of Klein, and to the same division of that genus as the Graining, *Leuciscus Lancastriensis*.

The specimen taken was  $6\frac{1}{2}$  inches long, and being a young male fish, was slender in proportion to its length. The general colour a dusky blue on the back, becoming brighter on the sides, and passing into silvery white beneath. The lateral line, descending from the upper angle of the operculum, takes a course along the side parallel to the curve of the belly; scales of moderate size; dorsal and caudal fins dusky brown; pectoral, ventral and anal fins pale orange red; head rounded and blunt; upper jaw the longest, the under jaw shutting within it; nostrils pierced on the upper side of the head, rather nearer the eye than the upper lip; irides orange; cheeks and operculum silvery white; first ray of the dorsal fin arising half-way between the anterior edge of the orbit of the eye and the end of the fleshy portion of the tail, the first ray short, the second the longest, the last ray double; of the anal fin also, the first ray is short, and the last ray double. Bloch says, this fish prefers clear rivers and large lakes, in which it deposits its spawn in the months of March and

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April. It is said to feed on worms, small white snails, and water-insects. In its appearance this fish somewhat resembles our Roach, but is much less deep for its length, and darker in colour; it seldom exceeds half a pound in weight, and is not in much esteem as an article of food. Like most of those fishes that swim near the surface, the specimen herein referred to died very soon after being taken out of the water. The numbers of fin-rays were as follows:

D. 9. P. 16. V. 9. A. 10. C. 20.